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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/836,029	04/17/2001	Charles Calvin Byers	50001-10390	8777

7590 10/17/2003

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EXAMINER

ARTMAN, THOMAS R

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/836,029	BYERS ET AL.	
	Examiner	Art Unit	
	Thomas R Artman	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5-8, 11-13, 15-19, 21-24 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Ouchi (US 6,477,286).

Regarding claim 1, Ouchi discloses interconnected printed circuit boards (PCBs) (Fig.5), including:

- 1) a first circuit board on top of a second circuit board (item 30 and identical one above it), where the boards are generally parallel with the first board on top,
- 2) a light source coupled to the first circuit board (any one of the lasers in the mounted optoelectronic chips, such as item 47 of Fig.6A) that transmits a signal,
- 3) a photodetector coupled to the second circuit board (any one of the photodiodes in the mounted optoelectronic chips, such as item 46 of Fig.6A), and
- 4) the boards are arranged such that the signal is received by the photodetector along an optical transport medium (item 36).

Regarding claim 16, Ouchi discloses the method for interconnecting PCBs, including:

- 1) affixing a first circuit board adjacent to and above a second circuit board (item 30, and identical PCB above it),
- 2) transmitting over an optical transport medium (item 36) an optical signal from a light source (item 47 of Fig.6A) on the first circuit board to a photo detector on the second circuit board (item 46 of Fig.6A).

With regards to claims 2 and 18, an optical transport medium that the signal travels through is free space (spaces between the components, waveguides, etc., along the optical path).

With respect to claims 3, 17 and 19, the optical transport medium is a light pipe (item 36).

With regards to claims 5, 6, 21 and 22, the light source is a laser diode, specifically a vertical cavity surface-emitting laser (VCSEL).

In regards to claims 7 and 23, the photodetector is a photodiode.

With respect to claims 8, 13, 15 and 24, the light source has a lens (item 57 of Fig.6A and col.9, lines 26-29).

In regards to claims 11 and 27, each circuit board has a surface for mounting components, and the surfaces are parallel to each other.

With respect to claims 12, each circuit board has a plurality of light sources and photodetectors such that each board sends and receives optical signals over transport media.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouchi and in view of Plotts (US 6,485,192).

Regarding claims 4 and 20, Ouchi does not disclose the specifics of the connectors (item 35) for the light pipe (item 36) to include a ferrule to hold the light pipes.

Plotts teaches details of optical fibers (light pipes) in a ribbon arrangement similar to Ouchi's light pipes that includes a ferrule (Figs. 1-3, item 46) that holds the light pipes (items 47). The use of a ferrule in a connector for holding a light pipe (in this case, an optical fiber) is well-known to one skilled in the art for making reliable optical connections between a light pipe and another optical device. The ferrule holds the light pipe in place for accurate and precise alignment.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a ferrule for Ouchi's light pipe as taught by Plotts for ensuring a reliable optical connection between the light pipe and the other optical devices.

With respect to claim 14, Plotts' ferrule has a physical well into which the light pipe is placed.

Claims 9 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouchi and Plotts and in view of Jewell (US 6,421,474).

Regarding both claims, the light pipes of Ouchi and Plotts are transparent cylinders; however, they do not specifically disclose that the light pipes are made of plastic.

Jewell states, in col.7, lines 16-22, that glass and plastic light pipes (optical fibers) are well known in the art and used throughout the communications industry.

It would have been obvious to one of ordinary skill in the art at the time the invention was made that the use of plastic or glass light pipes is an obvious matter of design choice depending upon the specific needs of the application, such as high or low ambient temperatures, etc., and without further criticality stated by the applicant.

Claims 10 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouchi.

Regarding both claims, though Ouchi does not specifically disclose electrical connections between the first and second circuit board, it is stated in col.8, lines 3-11, that it is sometimes useful to transmit electrical power from one board to another. It is also useful to transmit slower

signals by electrical communication, since one skilled in the art would recognize that it is far cheaper to use electrical communication for signals that don't require the high speeds of optical communication.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include electrical connections between circuit boards in order to provide essential electrical power and to cut costs by using electrical communication for slow signals.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (703) 305-0203. The examiner can normally be reached on 8am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (703) 308-4858. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Thomas R. Artman
Patent Examiner
October 6, 2003



DAVID V. BRUCE
PRIMARY EXAMINER